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PROGRAM DEVELOPMENT TO EDUCATE NURSES REGARDING PRESSURE ULCER DETECTION AND DOCUMENTATION

A Major Paper Presented

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PROGRAM DEVELOPMENT TO EDUCATE NURSES REGARDING PRESSURE ULCER DETECTION AND DOCUMENTATION

by

Margaret A. D'Orazio

Major paper submitted to the Graduate Faculty of

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in partial fulfillment

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Abstract

Pressure ulcers continue to be a major health care problem in terms of pain, quality of life, and loss of function for patients entering the acute care system. The ability of nursing professionals to identify, treat, and clearly document pressure ulcers present on admission (POA) is a safety indicator distinguishing good hospitals from Centers of Excellence. Competence of the nurses at the point of entry is critical to perform an accurate skin assessment. Timely identification, objective measurement, treatment, and documentation of pressure ulcers require that nurses have adequate knowledge of this complex, multi-factorial condition. The purpose of this project was to increase Emergency Department nurses' knowledge about pressure ulcer risks, staging, and wound description for documentation purposes. Benner's (1986) research, based on the Dreyfus and DreyfusModel of Skill Acquisition, was used as a framework to explore the impact of an educational program on nurses' knowledge levels to advance clinical practice and awareness of practice standards. Findings, recommendations, and implications for nursing practice are presented and discussed.

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Program Development to Educate Nurses Regarding Pressure Ulcer Detection and Documentation

Statement of the Problem

A pressure ulcer is localized injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure or pressure in combination with shear and/or friction (National Pressure Ulcer Advisory Panel [NPUAP], 2007). Pressure ulcers create significant clinical, legal (Salcido, 2008), economic (Centers for Medicare & Medicaid Services [CMS], 2009; Zhan & Miller, 2003), and regulatory problems for patients and providers alike. The United States (US) spends an estimated $2.2 to $3.6 billion each year on the treatment of pressure ulcers (Bryant & Nix, 2007; Reddy, Gill, & Rochon, 2006). Annually, approximately 1.3 to 3 million people develop and are treated for pressure ulcer related complications in US acute care facilities (Reddy et al.). Likewise, this condition causes significant pain, alteration in life satisfaction (Gorecki et al., 2009), extended hospital stays (Wolverton, Hobbs, & Beeson, 2005), and morbidity and mortality complications including stress to the immune system and infection. Pressure ulcers increase demands on health care resources and are often a source of malpractice litigation (Salcido, 2008). The death of actor Christopher Reeve in 2004 from an infected pressure ulcer re-focused educational initiatives on skin care treatment, and thrust surveillance of this condition back into public awareness and health care agendas (Catania et al., 2007). Health care professionals revisited their facilities policies, procedures, equipment, methods of communication, and risk management guidelines. However, the challenge has been incorporating these guidelines in a consistent manner in critically ill, often medically unstable patient populations. Risk assessment tools may not always adequately capture the various intrinsic and extrinsic risk factors associated with pressure ulcer development. The stakes have

never been higher, as nurses are required to address the top two concerns of American hospitals, reimbursement and positive patient outcomes.

In acute care, patients' condition may change rapidly. Increased ability to identify risk factors and high-risk groups, development of skin assessments with staging algorithms, and an emphasis on documentation have resulted in a paradigm shift toward measuring nurses' knowledge, and whether or not this knowledge is translated into practice. Inpatient educational efforts have proved successful and should be replicated in such areas as the Emergency Department (ED) in order to better ensure quality nursing care throughout the acute care stay. For example, a quality improvement project developed by Chicano and Drolshagen (2009) in a 243 bed acute care medical center utilized intense staff-driven interventions and a multi-disciplinary skin team approach to reduce the incidence of hospital acquired pressure ulcers (HAPU). The results included a drop in hospital acquired pressure ulcers on an immediate care unit from six ulcers in one year to one ulcer the following year. These findings offer direction for nurse educators implementing early pressure ulcer prevention protocols and process improvement standards for skin care in the ED.

Demands on nursing education and documentation will continue and include time constraints, limited resources, organizing the interface between computer technology and human conditions, and significant shortages of experienced RN's. Although nursing personnel have primary responsibility for skin care and pressure ulcer prevention programs, education also requires leadership and commitment from nursing administration. The clinicians' judgment, patient involvement, and the corresponding growing body of knowledge of this multi-factorial condition have implications for evidence based clinical practice. Caring for patients who are more likely to be older, are acutely and complexly ill, are frequently transferred from other facilities and are

often transferred multiple times within a single facility, who may have a history of pressure ulcers or who meet risk factor criteria, clearly necessitates timely skin assessments by competent nurse providers. It is evident that people seeking care in the (ED) may lie on their backs for extended periods ("Take Steps…", 2009; van Rijswijk, & Lyder, 2008), putting them at risk for pressure ulcer development. Tarpey, Gould, Fox, Davies and Cocking (2000) suggested that an estimated 40% of patients admitted through the ED are at risk for pressure ulcer development including those with diabetes or candidates for orthopedic or cardiac surgery being at particularly high risk.

Community health nurses have a long-standing history, along with those employed in long-term care facilities, for scoring higher on incidence/prevalence prevention rates of pressure related incidents (Ayello, Baranoski, & Salati, 2005). Knowledge levels of those registered nurse staff related to the proper management of risk factors, tools for detection, patient centered interventions, and treatment plans that involve ancillary staff and family members were found to be far superior to those in acute care settings (Ayello). Therefore, it seems reasonable to focus educational improvements on the major point of entry for new patients to acute care, the ED. The purpose of this project was to increase ED nurses' knowledge about pressure ulcer risks, staging, and wound description for documentation purposes.

Literature Review

Background

The following databases were searched for evidence on pressure ulcer care: MEDLINE: CINAHL, EBSCO HOST, PUBMED, AND OVID. Keywords search included 'pressure ulcer', 'pressure ulcers and ED, 'pressure ulcer emergency room risk assessment 'and 'pressure ulcer' and 'nursing education'. All available abstracts were read and assessed for relevance. Journal articles, research, and consensus statements were reviewed and evaluated for inclusion.

A pressure ulcer (PU) is a debilitating lesion of the skin caused by excess pressure, shearing or friction forces (NPUAP, 2007) usually over a bony prominence. Despite modern technologies and preventive advances, the incidence of pressure ulcers in acute care remains unacceptably high (Catania et al., 2007). The NPUAP (2007) and the Wound Ostomy Continence Nursing Society (WOCN, 2003) recognized six stages in describing the characteristics of pressure areas in the clinical setting. Stage I, defined as intact skin with non-blanchable redness of a localized area, may be difficult to identify in patients with dark pigmented skin. Partial-thickness skin loss involving the epidermis or dermis is classified as stage II. Stage III ulcers include full-thickness skin loss extending through subcutaneous fat tissue without bone or tendon involvement. Stage IV pressure ulcers are full thickness tissue loss with exposed bone, tendon, or muscle. Bruising indicates suspected deep tissue injury and full thickness wounds with slough or eschar covering the base are classified as unstageable (NPUAP, 2007). The NPUAP has developed competency-based curricula for pressure ulcer prevention and identification using this staging process.

Discussions in the literature and expert opinions report that pressure ulcers are largely preventable in many cases. This is a profoundly important care issue from a nursing, regulatory,

and legal standpoint as the link to quality relies on the consistent application and documentation of effective preventative interventions.

Incidence in the acute care setting is defined as the percentage of patients who develop pressure ulcers after admission to the hospital (Ayello & Braden, 2001). According to one study, the incidence of pressure ulcers in hospitalized patients in the US ranged from 1.5% to 10.27% (Redelings, Lee, & Sorvillo, 2005). Kaltenthaler, Whitfield, Walters, Akehurst, and Paisley (2001) documented incidence rates as high as 65.6% in acute care settings. Above all, having an ICU stay was associated with a doubling of pathologic skin damage risk (Baumgarten et al., 2008; Stechmiller et al., 2008). Common areas for pressure ulcer development include the coccyx, heels, elbows, hips, and occipital region of the head; skin tears, lacerations, excoriation, and arterial/venous ulcers are not considered pressure ulcers (NPUAP, 2007). Subcutaneous and muscle tissue are more susceptible to pressure induced injury (Reddy et al., 2006) and therefore may involve more damage than is evident from initial appearance on inspection.

According to the United States Department of Health and Human Services (USDHHS, 2006), the number of persons aged 65 years or older numbered 38.9 million in 2008, and there will be an estimated 72.1 million elders in America in 2030. This represents a statistical rise of 12.4%, and in 2030, 19% of the US population will be older adults. Aging is the number one factor affecting skin integrity, which has significant implications for health care providers attempting to prevent pressure ulcers (Maklebust, 2005; Wann-Hansson, Hagell, & Willman, 2008). In fact, gerontologists have identified pressure ulcers as a geriatric syndrome in much of the literature (Armstrong et al., 2008; Berlowitz, Brand, & Perkins, 1999; Saliba et al., 2005).

Pressure intensity, duration, moisture, and shearing forces, as well as tissue tolerance are known to be risk factors for pressure ulcer development (Tarpey et al., 2000). Intrinsic and

extrinsic risk factors for pressure ulcers are identified in the literature. Intrinsic risk factors include immobility, compromised nutritional status and incontinence (Baumgarten et al., 2008). Immobility is identified as a patient factor (Lindgren, Unosson, Fredrikson, & Ek, 2004) and, especially when combined with aging and other comorbid conditions, predisposes the skin to pain and breakdown. The effects of immobility on nearly every organ in the body are clearly defined in the literature and have implications for pressure ulcer development and the healing process (Olson, 1990). Compromised cardiac function, including orthostatic hypotension and impaired blood flow, cause ischemia and decreased blood supply to the peripheral circulation. This process in turn diminishes nutrition and oxygen supply to the cells of the skin, especially in dependent, posterior bony areas (Olson). Furthermore, immobility impacts pressure ulcer development through compromised oxygen carrying capacity of the respiratory system (Olson). Constipation, decreased appetite with resulting malnutrition and muscle atrophy, and increased urinary nitrogen excretion from catabolic cellular activity further contribute to pressure ulcer development, especially in incontinent patients (Lindgren, Unosson, Fredrikson, & Ek, 2004). Other physiological risk factors for pressure ulcer development include cerebral vascular accident, hypotension, diabetes mellitus, peripheral vascular disease and sepsis (Lyder, 2007). Sepsis can progress to multi-organ dysfunction, which will definitely affect the largest organ of the body, the skin. Other risk factors for pressure ulcer development include an altered mental status, specifically sedation or dementia, which effect patients' ability to respond to pressure-related discomfort, hydration, medications and co-morbid critical disease syndromes (Gorecki et al., 2009).

Similarly, characteristics of ED practice settings predispose patients to extended periods of immobility-related pressure risk (Baumgarten et al., 2008), and include procedures and events

that contribute to or exacerbate tissue injuries. Nursing strategies aimed at practice behavior change can target and modify these extrinsic factors to ensure provision of the best pressure ulcer prevention and treatment possible. According to Baumgarten et al., extrinsic factors like length of stay in the ED, waiting for either testing or transfer orders, or completion of procedures, along with physical restraints and inadequate cushioning of stretchers, can adversely affect patient skin care outcomes. Other extrinsic factors associated with pressure ulcer development in the ED include the length of stay correlated with night or weekend admissions and administration of any of 65 medications on the formulary in the ED associated with somnolence or sedation as a possible side effect (Baumgarten et al., 2008).

Policy/Initiatives Related to Prevention of Pressure Ulcers

Undoubtedly, the Healthcare Cost and Utilization Project (HCUP), developed by the Agency for Healthcare Research and Quality (AHRQ), created more transparency in the reporting of patient safety issues in hospitals as pressure ulcers came to be associated with a lack of quality nursing care. In 2007, The American Nurses Association (ANA) reaffirmed skin integrity as a measure of nursing care quality. The National Database of Nursing Quality Indicators (NDNQI, 2009) quantified nursings' influence on outcomes by measuring skin care risk factors, prevention, detection, and treatment management at the hospital, national, and unit level. The US Department of Health and Human Services document *Understanding and Improving Health* (2008) stated that reducing pressure ulcer incidence is an imperative for all health care providers.

The European Pressure Ulcer Advisory Panel (EPUAP, 1998), the Agency for Health Care Policy and Research (AHRQ, 2007), The WOCN (2003), and The Joint Commission (2007) agreed that National Patient Safety Goal 14, preventing health care-associated pressure ulcers, requires intensive focus on staff interdisciplinary training and education. Included in these

recommendations is a thrust on identification of pressure ulcer risk factors, staging, and early implementation of preventative strategies, which augment the practitioner's clinical judgment. Language in more focused healthcare policies has moved toward documenting the consistent application of effective interventions and linking clinical practice with improved patient outcomes. The ability of nurses to delineate between a deep tissue injury and a stage I wound is essential for directing care under the current classification system. Staging helps to guide standardized assessments by formalizing descriptive language on the depth, drainage, surrounding tissue integrity, and width of observable skin destruction (NPUAP, 2007). The vast majority of prevalence and incidence tracking strategies, national benchmarking, and increasing pressure of liability and responsibility on quality nursing care can be seen in a renewed thrust globally toward preventative care processes (Salcido, 2008).

Economic demands continue to link excellent patient care outcomes with financial implications under new payment provisions developed by regulators and insurance stakeholders. As of October 2008, the Centers for Medicare and Medicaid Services (CMS) enacted several mandates to reduce the rates of pressure ulcers in the acute care environment. CMS set forth guidelines to decrease reimbursement to hospitals for treatment of stage III & IV ulcers acquired during hospitalization (HAPUs) (CMS, 2009). Stage III ulcers include full-thickness skin loss extending through subcutaneous fat tissue without bone or tendon involvement. Stage IV pressure ulcers are full thickness tissue loss with exposed bone, tendon or muscle (NPUAP, 2007). Defined as a 'reasonably preventable' hospital acquired condition, Medicare considers pressure ulcers a 'never event', comparable to wrong site surgery, and reported as a reflection of sub-standard nursing care. Medicare has adjusted financial payments to compensate for the primary diagnosis as though the secondary diagnosis (ulcer) were not present (Paciella, 2009).

Conversely, CMS will increase funding for stage III & IV pressure ulcers present on admission (POA). Of interest, an earlier study by Pieper, Sugrue, Weiland, Sprague, and Heimanc (1998), found that patients admitted with pressure ulcers tended to have more stage III or IV ulcers (58%) compared with those who developed ulcers later (13%).

Compliance with CMS guidelines is critical for hospitals to validate the quality of care provided to patients. Additionally, the ability to show not only compliance, but also consistent compliance, is necessary to maintain Medicare certification. The appropriate use of reimbursement will be contingent on accurate and timely skin assessments, physician involvement, documentation, and nursing knowledge transfer to sustain practice (Catania et al., 2007; Salcido, 2008). Most recently, on March 3, 2010, The National Pressure Ulcer Advisory Panel (NPUAP) released a consensus statement, with unanimous agreement, from 24 multidisciplinary experts in pressure ulcer research that the definition of 'unavoidable' in certain settings is validated. Such cases might include those in which a client's hemodynamic instability prevents turning, or one in which a patient refuses to participate in treatment interventions.

Increasingly, payers and facilities alike are searching for ways to share the monetary responsibility of morbidity and mortality costs as well as the well-established legal liability associated with pressure ulcer development. Both home care and long-term care facilities are examining their policies and preventative processes for important documentation and tracking that can alleviate patient suffering and the financial burden of caring for pressure ulcers that developed because of acute institutionalization. The Institute for Healthcare Improvement (IHI, 2006) recommended evidence based best practice to address pressure ulcer development as part of their *Save 5 Million Lives* campaign. Integral to the physical assessment is the identification, treatment, and documentation of skin integrity issues. This condition should trigger care planning

early in the encounter and offer patients and families guidance for self-care and follow-up if discharged back into the community. Pressure ulcers are also associated with significant quality of life issues (Gorecki et al., 2009). Factors affecting quality of life include pressure ulcer pain, sleep disturbances, loss of appetite, feelings of anger and powerlessness along with mood disorders and hopelessness (Gorecki et al.). Inadequate knowledge of pain is a barrier to its management. Clinicians need to evaluate the impact of pain associated with dressing changes and mobility by setting up a schedule of pre medicating patients to maximize their ability to eat (Pieper et al., 2009), socialize and ambulate. Demonstrating provider skills in proper positioning, care plans with individualized rest periods, nutritional supplements, and adjunctive counseling therapies, along with optimal support surfaces and protective devices, help improve quality of life patient issues.

Detection, documentation, and progression of wound characteristics contributes to movement toward a "robust data-driven improvement processes" (Salcido, 2008, p.305) including patient-oriented research, new treatment strategies for chronic wounds, and proper management plans to evaluate the process of healing. Crucial steps toward meeting the new payment provisions by regulators include documentation of assessments using universal wound care terminology in a consistent manner and physician/provider involvement (Clarke et al., 2004). Without accurate documentation, a substantial and possibly insurmountable financial and legal burden shifts to the provider (Armstrong et al., 2008). Institutional policies should support nurses' efforts to work collaboratively with other healthcare providers and create a systematic, easy way to develop, implement, and record evidence based pressure ulcer prevention protocols as well as nursing, patient, and family education.

Pressure Ulcers in Acute Care

Despite many technological advances in preventive strategies, acute care institutions are plagued by unacceptable levels of pressure ulcer incidence (Catania et al., 2007). An estimated 2.5 million patients are treated for pressure ulcers each year in US acute care facilities (Lyder, 2003). An aging population (Lyder, 2007), complex co-morbid conditions, organizational factors such as staffing challenges, and competing resource allocation have threatened the integrity of holistic nursing care. In acute care, it is imperative that nurses identify high risk patients, including those with previous pressure ulcers, candidates for cardiac surgery (Lewicki, Mion, Splane, & Samstag, 1997), those admitted from long term care facilities (Keelaghan, Margolis, Zhan, & Baumgarten, 2008), and people with diseases that alter the oxygen carrying ability of the blood stream. Often, these population-specific risk factors and critical illness conditions alter tissue tolerance and patients' ability to respond with compensatory healing measures (Baranoski, 2006)

Acute care itself can be a risk factor for pressure ulcer development. A retrospective study (Levine, 1995) conducted at the Jewish Home & Hospital for the Aged in New York found that, when controlling for functional status, residents admitted with pressure ulcers had increased mortality rates. Likewise, they found that many of the ulcers resulted from transfers to hospitals for acute care, and the authors questioned whether hospitalization itself resulted in optimum outcomes for their residents. Part of their recommendation was to consider the delivery of acute care treatments in nursing homes, as the risks seemed to outweigh the benefits of transfer. In addition, recent research by Wann-Hansson, Hagell, and Willman (2008) found that pressure ulcers and the insufficient use of preventive measures to relieve pressure are still a concern in acute care environments. Likewise, a study by Clarke et al. (2004) found no reduction in

incidence and prevalence rates in acute care despite innovative technologies and available preventative equipment.

The economic recession has restricted consumer access to high quality primary care, as the pervasive philosophy in healthcare toward treatment of critical illness instead of preventative care is generating sicker clients (USDHHS, 2000). Therefore, pressure ulcer detection, description, and documentation often takes a back seat clinically to the more life threatening patient issues seen in acute care such as respiratory or cardiac collapse, neurological trauma or acute renal failure (Paciella, 2009). Likewise, there has been what the ANA (2005) called in the *Health Care Agenda* a lack of education, utilization, distribution, and supply of registered nursing professionals.

There likely are many reasons for failures in providers' acquisition of pressure ulcer knowledge, application of this knowledge, and documentation of preventative measures. In a random survey of 300 acute care registered nurses, Moore and Price (2004) found that pressure ulcer prevention was not viewed as a priority. Nurses admitted to being less interested in skin care than other specialty areas of practice, acknowledging constraints of time and staff as barriers to organizing care needs. The study also reviewed the complex nature of reinforcing behavior change and suggested that positive attitudes alone are not enough to ensure that practice change takes place (Moore & Price). Rather, new strategies that empower key staff with social power to overcome barriers to change in behalf of organizational goals works better. Challenges exist with offering formal and informal educational programs that reach the most people at mutually convenient times. The content of evidence-based pressure ulcer education is disseminated in many different ways in the acute care setting. Organizational factors include a lack of adequate resources, multiple competing medical goals and priorities, limited skilled nursing staff, and a

lack of data collection tools that link implementation of preventative strategies with improved patient outcomes (Clarke et al., 2004). The old saying "if it wasn't documented, then it didn't happen" adds another layer of complexity, as turn schedules not clearly documented in the medical record may be viewed as a variance to excellent care planning (Wann-Hansson et al., 2008). Management struggles with offering educational in-services on company time, encouraging nurses to attend seminars/workshops, offering on-line modules or take home manuals, establishing mandatory attendance criteria or making pressure ulcer education part of annual competency testing. Whatever mechanism of dissemination decided upon, the challenge still exists that staff must feel the support of leadership and other team members who value their contribution to collaborative evidence based nursing care. Sustaining change requires open lines of communication between multiple disciplines and a non-punitive information feedback loop that continuously improves process data and links shortcomings to more staff education and/or successes to improved patient health outcomes. The dearth of written literature on risk assessment processes in acute care emphasizes an insufficient and inappropriate use of preventative interventions (Moore &Cowman, 2008). The search continues for the most dependable approach to pressure ulcer prediction with inter-rater reliability of influencing factors. Although risk under prediction is more serious for patients, over prediction means that patients receive needless pressure ulcer preventative care and nurse energies and hospital resources are wasted. There is a lack of consensus in the literature on the predictive validity of subjective assessment techniques over objective validated tools like the Braden, Norton or Waterlow scales for risk stratification (Anthony, Parboteeah , Saleh, & Papanikolaou, 2008). Anthony et al. (2008) argued that nurses often use their clinical judgment alone in determining which preventative measures to implement in the clinical setting. Rather, a combination of the

two approaches appears to improve performance and work best for detection and clinical prediction accuracy (Moore & Cowman, 2008).

The face of documentation is changing in acute care. The new electronic medical record is only beneficial if information is accurate, organized, and updated, allowing for caregivers that are skilled in accessing the data. Barriers like tedious drop downs, insufficient user assistance, or malfunctioning infrastructures influence staff perceptions of the credibility and effectiveness of the electronic decision support system (Kring, 2007). Information gathered in the ED assessment is invaluable in defining baseline wound characteristics along with modifiable risk factors, and must be accessible to inpatient nurses for continuity in the plan moving forward. Organizations have always struggled with continuity of care and filling the gap or the 'dropped ball' scenario during transfers within the hospital and across settings. The art of communication will always challenge professionals working in acute care, as primary care physicians in the community talk to families, who talk to medical hospitalists, who write orders for nursing and report to other physicians on consult. Nurses will continually need to have an updated clinical picture and communicate that plan effectively to other care providers, forming the foundation of safe hand-off policies like SBAR (situation, background, assessment, recommendation). Considering the challenges facing critically ill patients in acute care and the complexity of organizational and contextual issues in nursing practice, successful prevention of pressure ulcers requires caregivers have adequate knowledge of this complication and that skilled assessment and intervention begin at the onset of care, typically the ED.

Pressure Ulcer Detection and Prevention in the Emergency Department

Among patients in the emergency room, pressure ulcers are an important clinical problem in terms of detection, cost (Salcido, 2008), and quality of life (Gorecki et al., 2009). Often, the priorities in the ED concentrate on stabilizing the airway, repairing compromised circulatory systems, and correcting other trauma or behavioral issues ("Take Steps…", 2009). Full body skin assessments, risk factor extraction, and documentation of wound care issues may not make the top of the list of medical priorities ("Take Steps…", 2009). In the emergency room setting, patient load, staffing issues, complexity of care, and the exhaustive pace of clinical information require registered nurses to multi-task and prioritize assessment criteria ("Take Steps…", 2009).

The Centers for Disease Control and Prevention (CDC, 2005) reported that nationwide, the length of stay in emergency rooms was greater than two hours for 56.2% of admitted patients. Mount Sinai Hospital in Ontario recently reported length of stay for 90% of patients in February 2010 to be 5.6 hours for minor or uncomplicated conditions and 14.3 hours for complex conditions (*Time Spent in the Emergency Department for Mount Sinai Hospital*, 2010). Likewise, the community-based hospital that served as the site for this project has an average ED length of stay of six hours, according to the clinical nurse educator N. R. (personal communication, January 12, 2010). Tarpey et al. (2000) found pressure ulcer rates as high as 40% in patients who had been in the ED over two hours and comprised high risk group categories like elderly patients with mobility problems or those needing orthopedic surgery from falls. In addition, an earlier study by Pieper et al. (1998) found that 71% of pressure ulcers seen in the acute care setting were already present on admission. Findings last year in ED Nursing ("Take Steps…", 2009) recommended steps now to document ulcers 'present on admission' (POA). However, any tracking method of wound incidence present on admission will need

feedback processes (Stechmiller et al., 2008) that inform and improve ED nursing culture and practice. Evidence based guidelines must consider the context specific issues faced by nurses in the ED like patient volume, extended stays, critically ill elders, and time constraints spent away from the patient and family while documenting on the computer. Assessing risk for developing a PU does little good for the patient and institution if nursing is unaware of updated guidelines, have caseloads that do not allow for thorough risk assessments, or have overwhelming tasks to complete. Likewise, data gathered will only be effective if information from the assessment are linked to effective preventive interventions and inform practice knowledge on where things could have been done better.

Organizations have struggled with inadequate systems to audit and re-audit stretcher support surfaces and to track equipment aging or maintenance schedules (Baumgarten et al., 2008). Currently, stretchers in the ED are often without pressure-reducing surfaces, have structural deterioration, and are ergonomically unsafe because of flaws in design (Tarpey et al., 2000). Manufacturers have little regulation or accountability to demonstrate clinical effectiveness, and lack standards that require detailing the attributes of cushions or pressure relieving aids (O'Dea, 1994). Objective clinical evidence combining principles of bioengineering and physiology is missing, as is standardized support surface language and research on outcome focused skin implications (Tarpey et al., 2000).

Studies have not yet been conducted to determine whether formal risk assessments are needed in the ER. The use of risk assessment tools help ensure that individual risk factors are systematically evaluated (Bergstrom et al.,1998). However, the challenge still exists for nurse leaders to ensure that the scores from assessment scales and predictive validity link adequately to patient interventions and the outcome plans at all levels of care (Clarke et al., 2004). Acute care

systems frequently place emphasis on risk assessments obtained on admission using Braden scores for documentation and treatment purposes. The Braden Scale is a formal, internationally recognized tool for predicting patients at risk for pressure ulcers (Bergstrom, Braden, Laguzza, & Holman, 1987) that has undergone extensive validity and reliability testing (Bergstrom, Braden, Kemp, Champagne, & Ruby, 1998; Kring, 2007; Pancorbo-Hidalgo,Garcia-Fernandez, Lopez-Medina, & Alvarez-Nieto, 2006). However, many ED's use components or subscales of the Braden tool for screening and documentation, not the full scale itself (" Take Steps…", 2009). This represents a system limitation, as this approach may not adequately capture the full clinical picture. Likewise, the cut off score for determining risks has been variable from institution to institution, based on different patient populations and care settings (Kring, 2007). The Braden scale lacks the inclusion of fecal incontinence, a known factor for pressure ulcer development (Vanderwee, Clark, Dealey,Gunningberg, & Defloor, 2007). Adoption of national pressure ulcer risk standards have been slow, as critical care is always the priority in the ED. The national initiative for healthcare systems to move toward provider order management in an electronic medical record has added another layer of complexity to data organization (CMS, 2008).

The development of pressure ulcer bundles (Paciella, 2009), wound prevention protocols (Catania et al., 2007; Denby & Rowlands, 2010) , and policies nationwide to remove patients from backboards immediately in the ED have detailed the urgency required to address this insidious patient condition. Careful review of ED practices may help hospitals avoid the cost of HAPU's and alleviate further pain and suffering for patients. Nurses in the emergency room are vital and instrumental in identifying patient risk factors, staging, documentation, and communication of the skin care regimen to other caretakers. Therefore, staff education must be

evidence based, accurate, and tailored to meet the critical thinking skills of ER nursing personnel.

Pressure ulcer risk reduction improves quality of care by increasing nurse competencies and knowledge levels related to high-risk patients, staging, and standardized skin documentation. Documentation related to location and description of breakdown and 'present on admission' verifies that this condition did not develop while the patient was in the ED, and provides continuity of care should the patient remain in holding or be admitted ("Take Steps…", 2009). Documenting risk factors, staging, and tailored interventions ensure that pressure ulcer problems were not overlooked during the assessment process (Catania et al., 2007). These interventions promote higher standards of care, ensure the hospital is not charged with causing pressure ulcers, and create an environment of data-driven improvement in process, where clinical excellence can flourish in the ED.

Staff Development Related to Pressure Ulcer Prevention and Management.

Evidence based guidelines require nursing personnel extract risk and skin assessment data to guide treatment interventions, as irreversible damage can occur in as little as two hours of unrelieved pressure (Salcido, 2008). A continued focus must be placed on staff training in identifying patients at risk for pressure ulcer development earlier in the health care episode to avoid costly adverse outcomes. Detection, management, and documentation of pressure ulcers can be a challenge for the most skilled nurse. However, continuous improvement of skin care issues and accountability for patient outcomes will inevitably rest with nursing personnel. A solid understanding of risk factors and early mobilization help the clinician set up a care plan early in the hospital course (Clarke et al., 2004). Accountability is a mandate we all share in

nursing practice, which will be scrutinized beyond a checklist on a computer flow sheet as a key indicator of best practice quality (Moore & Cowman, 2008).

A process of consistency throughout the entire time spent in the care of health professionals in the hospital will help measure successful outcomes and highlight areas needing further attention (Tarpey et al., 2000). Assessment of baseline pressure ulcer features assists the clinician in noting wounds present on admission (POA), evaluating improvement in the wound from the current treatment regimen, and in determining the need to change skin care interventions and documentation (Moore & Cowman, 2008). Pressure ulcer baseline data will also be helpful to the wound specialist if called on referral, and can serve as a rich source of dialogue between nursing and patients regarding pertinent learning needs, fears, and risk factor modification (Salcido, 2008).

Computer based learning modules used to train nurses on the correct use of the Braden scale have been adopted by several major medical centers, i.e. Detroit Medical Center. Yet smaller community hospitals with fewer resources are often lacking in full-scale information systems (CMS, 2008). The Braden includes several subscales (sensory perception, moisture, activity, mobility, nutrition, friction and shear). From a timing standpoint, it may not be feasible to require ER nurses to extract data from each subscale. Yet, the validity of the Braden score may be in question unless data is gathered from the entire tool to measure and predict patient outcomes. While no tool is perfect, the consensus of the wound community is that standardized risk assessment, thorough histories, and skin surveillance are more accurate than nurses' judgment alone in recognizing individuals at risk for pressure ulcer development (Fisher, Wells, & Harrison, 2004). The debate continues in the literature as to the strength and accuracy of nurses' subjective clinical judgment over risk assessment tools in predicting pressure ulcer

development. The solution includes refining a combination of the two processes. Pancorbo-Hidalgo et al. (2006) found that no evidence exists that nurses' clinical analysis on its own is superior to risk tools in pressure ulcer prediction. As no tool yields 100% accuracy, rigorous testing of the reliability and validity of risk assessment tools, the sensitivity and specificity of population factors, and generalizability across settings is necessary (Kring, 2007). This is a difficult task, despite the parsimonious quality and widespread use of the Braden scale in acute care. The challenge will be to maintain a user friendly yet concise and robust measure that is able to capture pertinent patient data that estimates pressure ulcer risk accurately. The use of tools and clinical judgment to gather information on patient risk factors, documenting interventions, and communicating the plan are reasonable expectations for care planning in the ED (Tarpey et al., 2000). The acquisition and application of knowledge in pressure ulcer care requires educators meet the needs of already over worked nursing staff. The existence of a policy or protocol for skin care does not ensure that they will be followed in clinical practice. Currently, there are no randomized trials that compare risk assessment tools and professional clinical judgment in the assessment of a patients' risk of developing pressure ulcers (Moore & Cowman, 2009). It is accepted professional practice , however, to utilize rigorous assessment skills, a thorough medical history, and formalized risk tools in the clinical setting (Salcido, 2008). Armstrong et al. (2008) posited that the precise system may be less important than the fact that an "acceptable system is developed, deployed and rigorously used" (p.475).

Researchers in a recent systematic review asserted that guidelines might not be reaching their intended audience consistently, based on interviews with physicians and nurses who expressed feelings of frustration with a lack of education on pressure ulcer management (Reddy et al., 2006). Constructing systematic approaches to patient specific care plans include standardized

evidence based education programs and collaborative team goal setting. Advisory panels such as the National Pressure Ulcer Advisory Panel (1992) and the European Pressure Ulcer Advisory Panel (2002) called for process improvements and preventative protocols that include a multi-disciplinary team approach. Management must be supportive of policies that keep skin care products and intervention tools readily available for staff use. They need to support flexible times for workshops, audits, and on-line learning modules, which bring clinical guidelines and process improvements to the bedside (Clarke et al., 2004). Nurses need to know when to consult the enterostomal therapy (ET) nurse and how to navigate skin care order sets in computer databases. It is common practice at the site of this project to provide recognition and behavior reinforcement during performance evaluations when a nurse has appropriately consulted and followed through with evidence based pressure ulcer interventions. A query is sent from the enterostomal nurse to the nurse manager on the unit and merit is placed into the employee file when a consult was sought in patient care. Nurses must also feel comfortable engaging nutrition, physical therapy, and physicians in the early care of this vulnerable patient. (Bergstrom et al., 1987) In addition, it is imperative that nurses' aides and family are engaged, and take an active role in assisting in preventative pressure ulcer care through knowledge sharing and education.

There are several approaches in the acute care setting to organize the assessment process. Standardized evidence based education programs include protocols for proper skin assessment techniques through the 'bundles' (toolkit) approach coined by The Institute for Healthcare Improvement (2008) to evaluate and improve nursing practice. A bundle is a set of direct practice interventions that when combined lead to favorable patient outcomes (Paciella, 2009). Paciella (2009) as well as Ayello et al. (2001) and Lyder (2007) found that The Pressure Ulcer Prevention Protocol Interventions (PUPPI), used to assess risk, nutritional status, skin care, and

appropriate referrals, reduced the prevalence of pressure ulcers in their facility by 50%. Benchmarking helps to clarify how facilities' pressure ulcer prevalence rates compare to other hospitals with similar patient populations. Other staff education preventative approaches to pressure ulcer care consist of Turn Team Programs (Hobbs, 2004), continuous improvement committees (Sinclair et al., 2004), and the four D's: deterrence, detection, documentation, and diagnosis (Salcido, 2008). Educational in-services, case studies, and didactic informational sessions need to be concise and rewards or recognition based, including such activities by poster displays at nursing competency fairs and allowing for incentives that tie in to the employees' performance goals/evaluations.

Research by Baldelli and Paciella (2008) found improvement in patient outcomes from the creation and implementation of a pressure ulcer prevention bundle that was integrated into the hospital orientation program and 'skills day' for annual recertification. Identifying a champion on the unit with persuasive social power helps to change the culture of learning and acceptance of standardized evidence based educational programs of pressure ulcer care.

A recent study by Denby and Rowlands (2010) found that in a 176 bed, nonprofit Magnet designated community hospital, nurses were not using the Braden scale in the emergency room. Yet the inpatient admission document included the Braden scale, and was a required field for assessment and documentation. Nurse educators created modified risk factor identifiers adapted from practice guidelines and data derived from their research project. These were then provided to ED nurses to use in their assessment. The authors educated nurses on the findings of their study, which emphasized that 87.2% of the HAPUs were located on the heels, sacrum, and coccyx (Denby & Rowlands). The authors then developed a policy that directed that any patient who could not lift his/her head or heels off the stretcher would be considered high risk and

preventive measures would need to be implemented. Interventions included two-hour turn schedules, heel protectors with positioning devices, and incontinence care by applying protective cream. There was a growing awareness in this ED that exposure to prolonged or intense pressure, friction, shear, and tissue tolerance (Bergstrom et al.,1987) predisposes the patient to skin breakdown. There was also an increased understanding of the need to link ED nursing interventions to prevention of in-patient HAPU rates. This prompted nurse educators to target specific Braden sub-scale data on mobility, activity, moisture, and sensory perception as identifiers of risk when documenting on ED patients.

Along with the challenge of identifying standardized risk assessment criteria specific to the ED, the ED nurse must also understand the complexity of documenting in computer based informatics and data searches. Clarke et al. (2004) found that facility computer infrastructures were frequently 'malfunctioning', making the preventative program inaccessible, under-resourced, disorganized, and incompatible with other areas of the hospital, such as information stored in the pre-admission testing database. Documenting and retrieving patient information can be frustrating for the clinician, as certain electronic decision support technologies lack compatibility when searching or accessing pertinent patient information (Clarke et al.).

Summary

Pressure ulcers are a major challenge in acute care hospitals and nurses play a key role in prevention and management. Patients treated in the ED are at risk for pressure ulcers, particularly older adults with immobility issues, longer wait times, and co-morbid conditions that exacerbate acute illness and increase pressure ulcer risk. Health care institutions are continually looking for process and outcome improvements. The ED is the front door or portal of entry for patients into the acute care system. The ability of ED nurses to identify patients who are at risk

for pressure ulcer development is key in preventing unnecessary suffering and secondary complications as well as in reducing operational costs and legal liability for practitioners. Nurses' competence in staging and documentation is critical in beginning best care practices early, and also provides an opportunity for ED nurses to assume leadership roles in valuable healthcare strategies. To evaluate and interpret variables affecting nurses' knowledge scores regarding pressure ulcer identification, staging, prevention, and documentation means that the author looked at the credibility, meaning, importance, generalizability, and implications for ED nursing practice. Furthermore, giving thought to the aims of the study and its theoretical basis suggested that the investigator apply Benners' Theory of professional practice to tailor teaching strategies adapted from Malcolm Knowles' adult learning to generate an atmosphere of beneficial growth based on perceptual awareness in assessment skills. The processes of the Logic Model guided the format of the study design, and the established instrument by Pieper and Mott measured learning objectives. The purpose of this project was to increase ED nurses' knowledge about pressure ulcer risks, staging, and wound description for documentation purposes.

Theoretical Frameworks

Benner's Novice to Expert

Patricia Benner's Novice to Expert model (Tomey & Alligood, 2006) was used to guide development of this program development project. Patricia Benner (1984a) proposed professional growth and development in practice as directly related to educational needs being recognized and met throughout nurses'careers. Benner's application of the Dreyfus model highlights the importance of tailoring educational interventions delivered to nurses, with an understanding that the learning needs are different when they are new professionals as opposed to experienced practitioners (Tomey & Alligood, 2006). Benner (1984) applied the Dreyfus model to aspects of skill performance in nursing practice. The Dreyfus Model of Skill Acquisition includes five levels of experience: novice, advanced beginner, competent, proficient, and expert. Specifically, Benner described the difference and value between practical, experience based skill acquisition and theoretical or classroom based knowledge. As clinical practice skills develop, nurses re-focus their decision making process based on perceptual awareness rather than on process-oriented fundamentals. The novice practices within the domain of rules and behaviors guided by protocols. There is little to no experience to guide their clinical decisions. The advanced beginner relates to the "aspects of the situation" instead of the big clinical picture (p. 118). Clinical guidelines impact practice, and are integrated in the form of contextual pieces without differential importance to the whole picture. Nurses at this level need support in setting priorities for health care plans and following through with objectives. The competent provider demonstrates a planned perspective in determining interventions needed now, and which plans can wait until later. A planned perspective of the clinical situation defines this stage. A proficient nurse perceives situations as a whole versus unconnected parts.

Perception is the key in this stage, as the nurse learns to integrate aspects of health pattern recognition and intuitive practice. These nurses learn best with case studies and inductive teaching in which they can explore positive and negative learning situations. Finally, the expert understands the trajectory of a problem consistently enough to predict the outcome. These nurses work one-step ahead of others in mobilizing resources and meeting the next contingency plan for problem solving. This nurse moves from detached observer to involved performer by fully engaging in the healthcare experience (Benner, 1984) and nurturing the concept of reflective practice in her profession.

Benner's framework is applied in the target institution to augment progression toward nursing excellence as reflected in the hospitals' Magnet status philosophy. Benner's framework guides the clinical excellence advancement program and has been formally adopted as a philosophical framework to guide this institutions' nursing department. In this program development, Benner's framework was used to guide selection of expert nurses to champion completion of surveys, attendance at the educational program, and to role model appropriate pressure ulcer prevention assessment, treatment, and documentation behaviors for mentorship purposes. The clinical nurse educator in the emergency department identified a charge nurse on the day shift and an experienced nurse leader on the evening shift to 'talk up' the program and organize relieving other nurses from duty to attend the in-service. In the long term, it is hoped that this program will influence the adoption of basic and advanced preceptor workshops on skin care management in the emergency room.

Knowles' Theory of Adult Learning

The development of this program was influenced by principles of Malcolm Knowles' (1970) theory of adult learning andragogy. Knowles described adult learning as a process of self

directed inquiry, with six learner characteristics that influence change. Using this framework, learners are described as autonomous and self-directed, possessing an accumulated foundation of experiences and knowledge, goal oriented, relevancy oriented, practical, and needing to be shown respect (Knowles, 1970). Educators need to consider previous life experiences and past educational or work endeavors, along with attitudes and biases, before creating a teaching plan. A cooperative learning climate is encouraged when adults are convinced of the need for knowing the information (Russell, 2006). Furthermore, a desire to connect with the learner, providing a challenge without causing frustration, and ensuring positive reinforcement all help the educator achieve knowledge goals (Russell). The nurse educator to several groups of ED nurses introduced this investigator prior to the pressure ulcer program to inform nurses who the investigator was and how the program was going to be structured. Success of any intervention depends on the degree to which both staff members and organizational management, view pressure ulcer prevention a clinical priority (Clarke et al., 2004). A positive attitude toward the program goals was promoted, since attitudes are important factors influencing behavior and unit culture. The nurses were informed that the program was voluntary and set up to accommodate nursing coverage on the unit.

The five steps to Malcolm Knowles' model of andragogy helped the investigator conceptualize the educational goals and guide the action stages. These included diagnosing learning needs with a survey of nurse leaders and staff regarding pressure ulcer knowledge. Formulating learning needs included an overview of risk factors specific to acute care, proper identification and description of wound stages and documentation. Institution policy and national guidelines were included in the evidence based interventions handout. The nurses were encouraged to collaborate with other disciplines to achieve optimal patient outcomes. The third

step includes identifying human material resources for teaching and learning. This was achieved by including the unit nurse educator, the enterostomal specialist and this author as sources of pressure ulcer information. Choosing and implementing appropriate learning strategies were based on Knowles' philosophy that adult learners are goal oriented, practical, and prefer content on a "need to know" basis. Since the in-service was offered during company time, the content was streamlined to allow for questions and answers in the beginning of the session in the hope of keeping the staff involved and tailoring content to meet the nurses' knowledge level. The program was flexible with learning tasks and with the flow of information. Finally, evaluating learning outcomes was facilitated by post-test results and dissemination of strategies to management and staff, including implications for nursing practice. Transferring knowledge to practice can be measured through chart audits, number of referrals to the wound nurse, and prevalence/incidence of hospital acquired pressure ulcer rates. Patient satisfaction can be evaluated through random surveys or Press Ganey scores specific to the ED. In summary, Knowles' principles of adult education were used in a five-step model to organize and implement change in nurses' knowledge of pressure ulcer risk factors, identification and documentation in the ED.

Program Development

Purpose

The purpose of this program development project was to increase ED nurses' knowledge about pressure ulcer risks, staging, and wound description for documentation purposes.

Needs Assessment

This project was conducted at an adult acute medical-surgical community teaching hospital affiliated with Brown University medical school. This institution has 247 beds, 2,475 employees, and is part of the Lifespan healthcare system. It was the ninth hospital in the country to receive Magnet status, and only the forth in the country applying for its fourth re-designation.

The ED has a population volume of >50,000 patients annually with 30 % of ED volume admitted, supplying 70 % of all hospital admissions. Population characteristics include predominantly adult and older adult to patients with a wide array of acute medical surgical problems. Trauma, pediatric, OB, and acute psychiatric patients may initially be seen in the ED, but are generally not admitted. The department consists of 80 RN's and one LPN. Five staff RN's and 2 ED leadership staff are certified in Emergency Nursing. No time frame is required to obtain certification but it is actively encouraged by the team. The majority of RN's have a BSN and approximately 40 ED nurses have been employed in the hospital for longer than 5 years. Previous formal pressure ulcer training was lacking with the target RN's, although each nurse completed check offs on a 'skin care' table offered at the annual competency training day in November, 2009.

The Logic Model (Longest, 2005), adopted from the University of Wisconsin Cooperative Extension, framed the educational program's investments to results. Key features associated with pressure ulcer education in the ED include the increasing emphasis by licensing and regulatory

groups to limit re-imbursement for hospital-acquired ulcers, and a growing interest in addressing risk assessment, staging, and documentation in the electronic medical record.

Key informant interviews. The comprehensive needs assessment focused initially on interviews with key informants to help to frame the problem. Highlights of those discussions most relevant to the purposes of this paper are presented. The impetus from this project evolved from a personal interview with NR, the clinical nurse educator in the ED at the host institution, revealing a disconnect between the staffs' ability to identify significant risk factors, staging, treatment guidelines, and consistent documentation of skin care issues in the documentation system used in the ED, Med Host. The educator noted that nurses may not be aware of the NPUAPs' new categories, deep tissue injury and unstageable, for descriptive purposes. Furthermore, a formalized risk tool was not being used to screen patients, as traditionally the admitting nurse captured these data during the admission process. NR noted that on average patients could lie on stretchers for six hours before testing is complete and a decision made to release or admit the patient after bed assignment. An interview with DB1 RN, theWound/ Ostomy specialist, revealed the statement," I can't believe we don't have the NPUAP's deep tissue injury and unstageable options for the nurses to choose from on the Med Host computer." She explained to this investigator that she worked in an ED before, and could testify that the environment can get so hectic at times that nurses may only call in a consult if a wound or dressing is "really big and bad". DB2, the Nurse Manager in the ED, was supportive of this skin care educational program, and voiced a need to "standardize" assessment and documentation tools. In a scheduled meeting, led by the Director of the ED, this author discussed program goals and contributions of needed space and time. The nurse manager and staff educator assisted with identifying days and times during the week to offer the program in order to reach the most staff

and in an effort to be the least disruptive to unit processes. The nurse educator offered her office for two hours on three days during the month of January 2010, and agreed to discuss the program with staff along with emailing a query of program goals. She also posted the program flyer (Appendix A) in high traffic areas on the unit looking for interested participants.

DA, the Director of the ED, verbalized an understanding of the value of pressure ulcer education/documentation for the nursing staff and offered her support. A verbal interaction with the day charge nurse on the adequacy or need for skin product tools in the clean utility room revealed, “We aren’t sure what we are looking at in this room or how to treat many broken down areas on the skin". On-site observation and evaluation of skin care products revealed outdated products with a variety of supplies that had accumulated over time. An email received from an experienced nurse stated, "I would love to learn more about pressure ulcer care, because we are getting more elderly people and patients that are sicker and vulnerable to multiple organ failure." She expressed interest in the program; however, she was going to be on vacation at the time of the offerings, so she wanted the written information left in her mailbox. The medical director was sent an email detailing the project and inviting him to participate in any way in this initiative. The investigator was unable to reach physician leaders. Involvement of a multidisciplinary team is based on literature describing success with organizational change to increase pressure ulcer detection through group cohesion (Sinclair et al., 2004).

Application of the Logic Model. Components of the Logic Model include the situation, inputs, outputs, outcomes, and impact. Inputs represent the problem description gathered from existing data, staff input and leadership expert opinion. Key stakeholders are identified and committed to achieving success in the educational program design. Inputs reflect the available resources, while outputs are the program activities. The outcomes are the results, such as

knowledge gains, which results in an Impact, or the enduring improvement in nursing practice, patient outcomes, institutional care and community health status. Each component of the Logic Model (Appendix B) will now be assessed.

For purposes of this project, the *situation* was pressure ulcer detection in the emergency room. A problem analysis focused on gathering institutional policies, pressure ulcer documentation guidelines, rates of hospital acquired pressure ulcers, and use of skin/risk assessment tools in the ED to capture areas of standardized practice or deficiencies in best practice behaviors. The nurse educator emphasized that the majority of nurses in the ED might not have knowledge of the NPUAP staging classification. Priorities and goal setting included creating an educational plan including updated information on pressure ulcer staging, risk factors, and documentation requirements specific to the ED. The final component of the logic situation was to engage stakeholders and nursing staff.

Inputs are defined by the quality and quantity of all resources utilized by the program such as materials, people, time, and money. Inputs or resources include nurse awareness of education related to 'present on admission' (POA) criteria and pressure ulcer prevention in the ED. Reporting of monthly prevalence data on hospital-acquired ulcers by an established pressure ulcer prevalence team (PUP) for benchmarking purpose verifies a commitment by management to patient skin care. Another example is a recently initiated hospital protocol requiring patients be removed from backboards immediately in the ED in order to avoid excessive pressure, friction, or shear on skin surfaces. A requisition for a dozen new stretchers with pressure reducing surfaces was recently approved for purchase this budget period. In addition, a cost benefit analysis is underway to replace older, cracked, and broken mattresses. Likewise, a process of upgrading the skin specific identifiers in the Med Host ED computer information

system has been initiated. Other inputs include the program developer's time and effort in reviewing pressure ulcer literature and analyzing the current practices of identifying and documenting wounds in the ED.

Outputs include what the program intends to do through participation and activities. Outputs or activities (behaviors) of nursing personnel were identified as key to improved outcomes, and included an expanded knowledge base for the nurses. In the long term, it was anticipated that reduced pressure ulcer incidence for patients, and less cost in nursing time and resource utilization for the system, might occur. External factors influence the program actions and include time, staffing, and money. There must be time, money, equipment/ technology, and partnerships with staff so that they feel included in the overall success in achieving positive outcomes. The recruitment process involves key leaders who facilitate getting the information to staff as well as their attending the sessions, and the nurses and or nurses' aides willingness to attend the educational experience. Positive reinforcement, reminders, and feedback help staff to view this process as something positive for themselves, their patients, and the institution.

The intended outcomes of this educational program include a change in nurses' knowledge and documentation about pressure ulcers. Hopefully, skills and attitudes regarding pressure ulcer care will also be impacted, as each team member values the difference they can make with a shared patient partnership. Likewise, opening up communication about the difficulties experienced when trying to prevent pressure ulcers can build a case for equitable nurse patient staffing ratios. Clinical effectiveness is one way we as nurses find out what our patient preferences are and how our own values, experiences, and beliefs may prejudice and bias clinical decision making. The same partnership is encouraged between care team members and requires an understanding of the problem, suggested interventions, and intended outcomes to involve

others in decision-making. Nurses in the ED value competent practice. Part of this commitment is demonstrated in proficient nursing, Magnet designation, and competence based not only on random control trials or scientific research but also on a clear understanding based on practitioner's common sense, intuition, and knowledge of the meaning that pressure ulcers has for the patient and their family. Sharing this knowledge is part of a nurse's professional contribution to our discipline. In the long term, it is anticipated that continued awareness of the multifactorial nature of pressure ulcers can influence departmental policies and behavior practices that directly benefit patients and reduce institutional nosocomial pressure ulcer rates. The ultimate impact is quality nursing care and patient outcomes for the people of this community. Reaching the hearts and minds of nurses through education adds to professional growth and excellent patient care.

Several assumptions were made. There is a need for pressure ulcer preventative strategies in the ED as evidenced by the literature and clinical experience. However, it is important to understand some of the complex problems in population mix, staffing, equipment, and computer documentation in the acute care ED. For example, it is more challenging to implement PU preventative education/strategies on an ongoing basis when the unit is short staffed from vacancies or experiencing high volume trauma issues, as in a natural disaster in the community. Equally, documentation is affected when information technologists initiate the roll out of a new software system or have periods of computer shut down for maintenance and inspection purposes. Staff need adequate training and support to navigate through institutional information systems. Likewise, different levels of care and their associated computer cells need to communicate and be readily accessible to care providers. Understanding the unit culture and the institutional/nursing management philosophy on education to improve outcomes needs to be

explored prior to formulating a teaching plan. There has been under-attention to surveillance of pressure ulcer's in the ED as evidenced by the lack of risk assessment criteria and policy along with standardized tool use. A fundamental shift in nurses' thought process is needed to understand that pressure ulcer's risk is real, that people will come to ED with them already, and that the responsibility for detecting ulcers POA is not left to the admitting nurse, as this can be several hours into the episode. The final component of the logic situation was to engage stakeholders and nursing staff to promote safety results-based performance behaviors. Understanding and engaging the culture of safety and the care philosophy embraced by the nursing staff is essential and contributes to a cohesive, highly functioning team.

Design

The program used a pre test- posttest design. Nurses completed a pre-test, attended an educational intervention, and then completed a post-test. The intervention was the educational in-service. The primary outcome variable was nurses' knowledge.

Sample

The sample included all nurses employed in the Emergency Department at the chosen institution. There were no exclusion criteria; all nurses employed in the ED were invited and eligible. Two nurses' aides and a housekeeper came to the offering and were not turned away.

Content outline and objectives

The content outline and objectives were derived from published literature, needs assessment, national guidelines, and clinical experience. Based on the needs assessment, several key issues were considered for program implementation: first, recognition that the program had to be of short duration (15-20 min); awareness that there had been some recent exposure to skin assessment guidelines at a required competency fair; and because of time, that the post-test

would have to be offered outside of the program, and a plan needed to be formulated to gather the post-test in a drop box honoring anonymity of the participants.

Content outline included the following major topic areas:

- General intrinsic/extrinsic factors contributing to pressure ulcer development. (Appendix C)
- Pressure ulcer risk factors specific to ED population
- Updated NPUAP 2007 staging guidelines
- Communicating the plan to patient/family, and team members
- Documentation in the Med Host computer database

Program objectives included: At the conclusion of this program, participants will be able to:

- Describe intrinsic and extrinsic risk factors
- Identify pressure ulcer risk factors specific to the ED
- Identify different stages of skin injury using NPUAP guidelines
- Communicate the plan to patient/family, team members
- Document in Med Host computer system

Procedures

The Lifespan IRB as well as the Rhode Island College IRB approved this program development project. About two weeks prior to the educational intervention, registered nurses

received an email briefly introducing the Master's student program developer, describing the purpose of the program, and the proposed content. The unit based educator distributed an informational letter describing the program details, survey, and the amount of time participation would take to all nursing staff via institutional email (Appendix D). Nurses were informed that when they were taking the pre- and post-tests they would be asked to use an anonymous three-letter test identifier, of their choosing, for tracking purposes so that the investigator could determine who participated in the pre, intervention, and post activities. They were assured that tracking would be used only for that purpose and that their responses would remain confidential. An IRB approved flyer (Appendix A) was placed on the bulletin board in the nursing lounge again describing the program and dates that it will be offered.

On the actual program offering dates, nurses who were interested in participating were again provided an informational letter instructing them about the program goals, its voluntary nature, and that it would take about 20 minutes of their time. The program was offered as an in-service in a *Lunch and Learn* format on at least two Fridays and one Tuesday in the clinical educator's office for ED registered nurses. Nurses working overlapping shift schedules were offered the option to attend between 7 am-10 am and 3pm-7pm. Previous pressure ulcer training and overall knowledge level were assessed by asking nurses directly and questioning them as to whether they knew updated pressure ulcer guidelines, staging language, and national initiatives in evidence based skin care. Pocket picture guides from the NPUAP were provided to nurses (Appendix E). Educational tools used during the program included the pressure ulcer knowledge test, NPUAP pocket guide staging cards, and a Smith & Nephew mannequin 'buttocks'. These hands-on practice activities were implemented to generate sample patient assessments while discussing mock plans of care. Handouts listing risk factors in acute care (Appendix F), a small

toolkit with small paper rulers for measuring pressure ulcers, sage wipes for incontinent patients, and transparent op-site dressings for covering wounds supplemented the assessment case analysis with the mannequin. Coffee, apples, water, and pens were offered to staff to break the ice and provide a comfortable learning experience. Time for questions and answers and hands on product discovery enhanced this educational offering. The investigator stayed for three hours during the days of the program, but total class time was approximately 20 minutes for groups of attendees.

Pre-tests were administered directly before the in-service and instructions were discussed related to completing a post-test two weeks after the session Participants were again asked to assign and add a three-letter identifier to the test for tracking purposes. About one week after attending the program, nurses were sent another email reminding them to complete the post survey, which could be found in the mailroom with their assigned identifier. Nurses were instructed in the email to place all completed surveys, without their names, in a drop box that will be centrally located in the ED.

Measurement

Basic demographic data limited to years of experience, previous experience with pressure ulcer management, and any pressure ulcer programs that had been attended was collected.

The instrument used to measure nurses' knowledge pre and post was a modified version of the Pressure Ulcer Knowledge Test (Pieper & Mott, 1995) (Appendix F). This measure is a 47-item test with a true false response format and three subscales that include risk prevention, staging, and wound. Evidence of content validity has been developing over time and expert opinion about the appropriateness of the measure was sought from the wound/ostomy nurse and the ED educator in this institution. Alpha reliability coefficients for the total scale for critical care

nurses were reported at .91; subscale values include .88 (prevention), .62 (staging), and .73 (wound) (Pieper & Mott).

Because the instrument is a 47-item measure, due to concerns about time constraints and recognizing that some of the items were not relevant to the ED, the author made the decision to consult with the wound/ostomy nurse to select questions that were most relevant to this project. For example, several of the risk subscale items were not relevant to the ED population. For the risk and prevention subscale, five of the relevant items in the measure and one additional item were added for a total of six. The complete staging subscale (seven items) was used. Four items from the wound subscale most relevant to this project were selected. One question from the updated NPUAP's 2007 definitions of unstageable was added to that subscale to reflect recent guideline changes. In addition, one item adapted for the Med Host documentation screen used in the facility by nurses was added. The adapted Pieper & Mott test consisted of a total of 19 questions. Questions on the test were answered as true or false. Analysis of this survey was carried out by examining the mean performance scores of nurses. Because there were 19 questions, each question was worth 5.3 points each. A passing score for the pressure ulcer knowledge test was determined by expert opinion to be a grade of 76 out of a possible 100.

Results

Demographics. Of 80 eligible ED nurses, 26 attended a presentation of the educational program on the offering dates. These registered nurses were generally woman (n=23). Although three males attended the in-service, only two took the pre-test. The nurses ranged in age from 20 to 54 years of age. Sixteen nurses took the pre-test (baseline) at the time of the in-service and 12 nurses returned the post-test survey two weeks after the educational program. Eight of the ED nurse respondents reported last viewing a pressure ulcer poster display at a competency fair last

November. Four of the participants reported that they had read about pressure ulcer risk factors and NPUAP prevention guidelines in the last six months.

Knowledge Survey. Participants' scores on the modified Pieper and Mott (1995) Pressure Ulcer Knowledge Test were analyzed. Table 1 illustrates the pre- and post- test scores for the 12 nurse participants.

Table 1.

Pre-post Pressure Ulcer Knowledges Scores (n=12)

PRE-TEST SCORE	POST-TEST SCORE
78.95%	73.68%
78.95%	100.00%
78.95%	84.21%
89.47%	89.47%
78.95%	73.68%
89.47%	94.74%
73.68%	68.42%
73.68%	84.21%
84.21%	89.47%
94.74%	84.21%
73.68%	68.42%
84.21%	94.74%

As can be seen in Table 1, in general scores for the participants were relatively high at baseline. Half of the participants improved (n=6) (50 %), five declined slightly (41 %), and seven (59 %) remained unchanged. Pre and post scores for the 12 participants are illustrated in bar graph form in Figure 1.

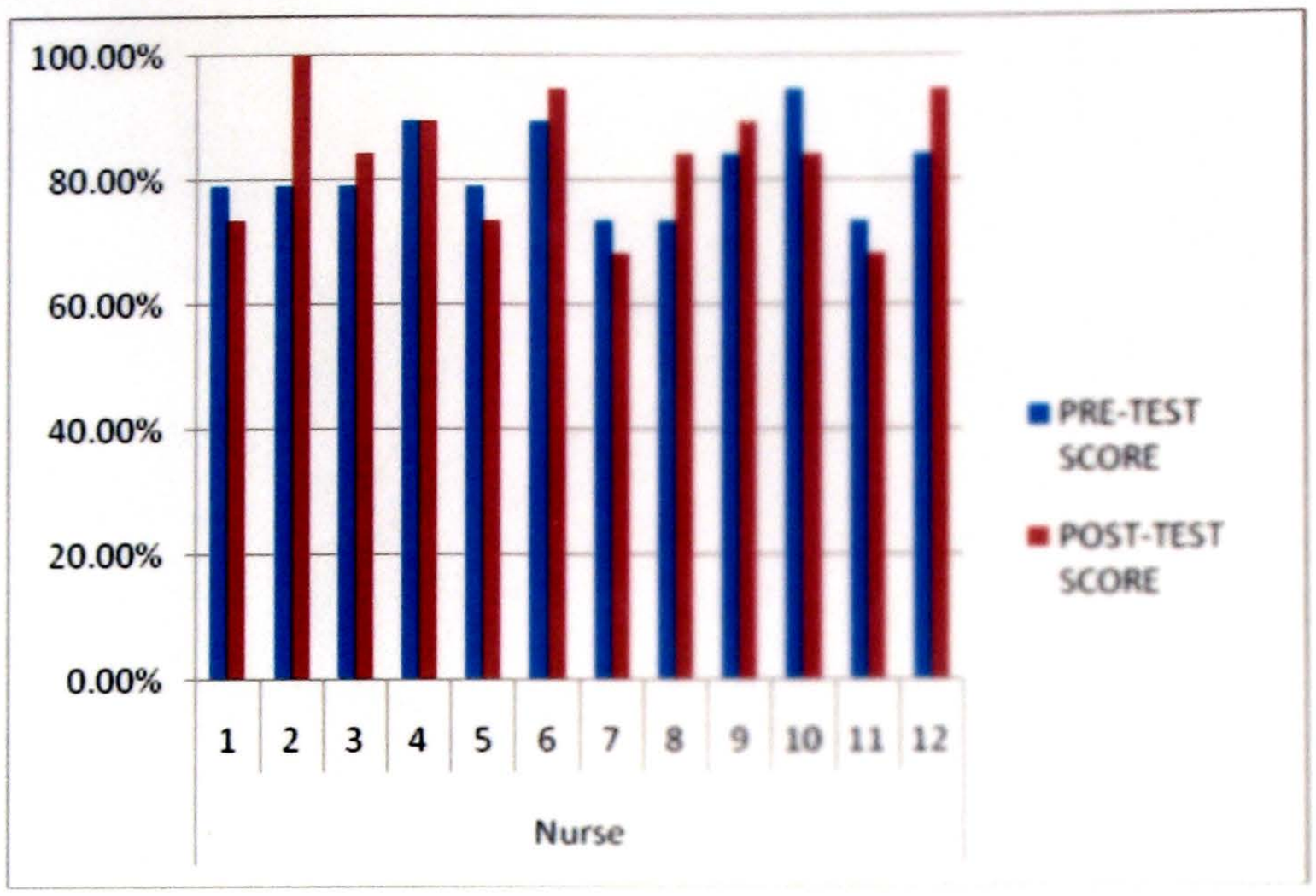

Figure 1. Pre-post test scores

An item analysis for the 19 question survey is illustrated in table 2. As can be seen, some questions were answered correctly by all participants (ie questions 1, 2, 9, and13), while some questions were answered notably incorrectly by many (ie questions 4, 7, and 8). For the individual items, ED nurses answered 11 items (58 %) of the test at a 90 % or above. Two risk factor questions (questions 1 and 2) and two staging questions (questions 9 and 13) represented the highest percentage of items answered correct at the 100 percent level. The highest level of incorrect responses was found with question four, addressing best practice schedules for when a standardized skin assessment is due for individuals at risk for skin breakdown. Again, examples of items with a low correct response and not well known by nurses included content about prevention or surveillance (question 4; 42%), followed by the role of humidity (question 7; 50 %) in pressure ulcer development, and staging or identification and description of deep tissue injuries (questions 8, 15, 16 and 19) with 59% answering them correctly.

Table 2.

Percent Correct on the Pressure Ulcer Knowledge Survey

Questions	Percent Correct
1	100
2	100
3	66.67
4	41.67
5	91.67
6	66.67
7	50
8	58.33
9	100
10	91.67
11	91.67
12	91.67
13	100
14	91.67
15	75
16	75
17	91.67
18	91.67
19	70

PRE-TEST SCORE	POST-TEST SCORE
81.58%	83.77%
2.69% Test Score Increase	

Figure 2 demonstrates that as a whole, scores improved post intervention (81.58% pre ; 83.77% post), an overall increase of 2.69%.

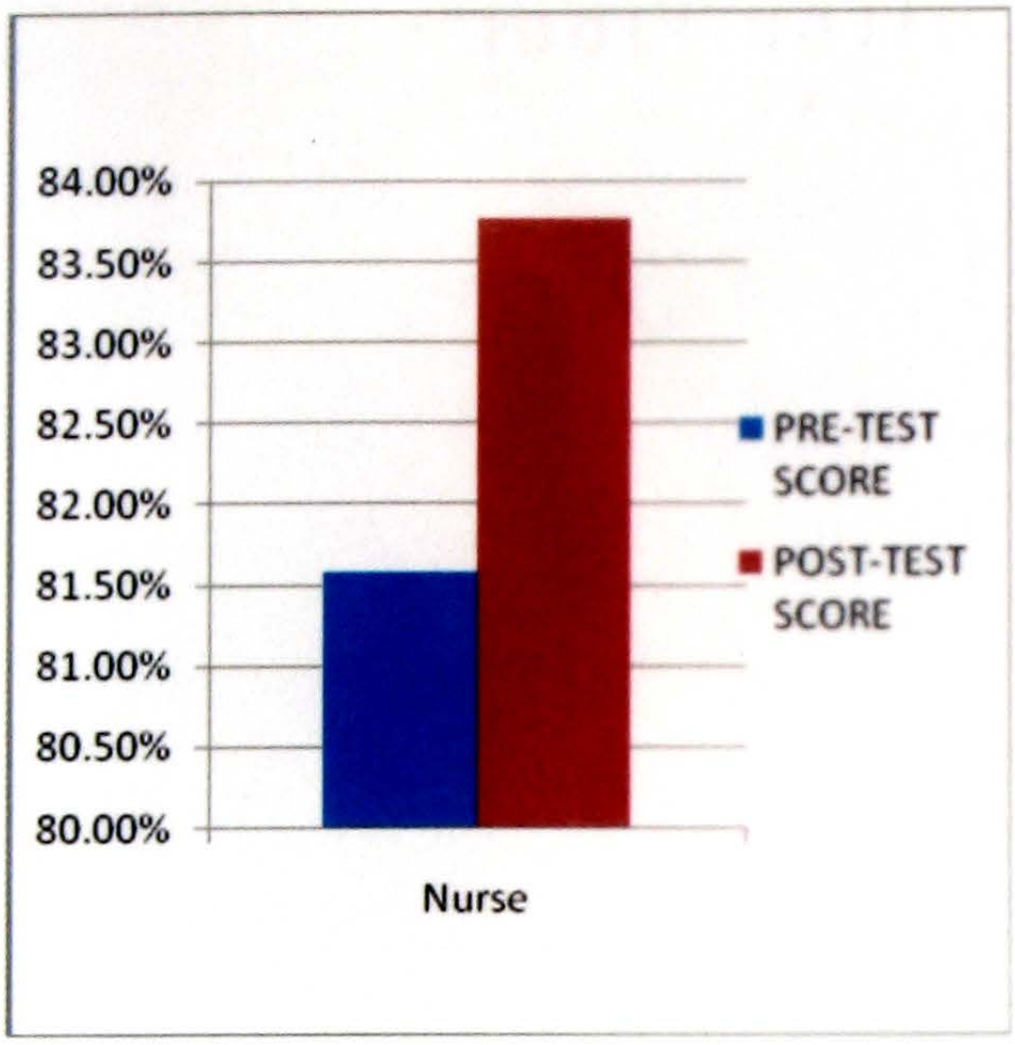

Figure 2. Average pre/post scores of nurses (n=12).

Program Evaluation

The investigator developed and administered an evaluation measure of the overall program that participants were asked to complete at the end of the session (Appendix G). Six nurses (n=6) filled out the evaluation completely. In general, the comments were positive regarding relevancy and organization and two suggestions were made to try to streamline pressure ulcer content into 10-minute periods. Additional comments by nurses included highlighting the need to use more Med-Host specific computer software for illustration purposes. Another comment beyond the scope of this project involved creating compatibility with current ED documentation policies. Finally, a suggestion was made about how to organize the clean utility room with pressure ulcer supplies. Overall, the program was evaluated very positively.

Summary and Conclusions

The purpose of this program development was to ascertain ED nurses' knowledge of pressure ulcer risk factors, identification, staging, and description for documentation purposes. Decreasing the incidence of pressure ulcers in acute care requires that nurses are knowledgeable about intrinsic, extrinsic factors, and preventive care strategies in potentially critically ill patients. Structured educational offerings provide nurses with information and tools that can be used to improve patient outcomes and advance professional practice. Among this cohort of ED nurses, knowledge levels of pressure ulcer identification and prevention management were reasonable at baseline, though areas for improvement were noted. Knowledge levels improved slightly with the targeted educational program, but maintenance will require the continued use of a variety of teaching techniques to maintain practice behavior change and a strong commitment to excellent nursing care. Innovative and exciting methods of teaching and reinforcement strategies require leaders analyze barriers and accentuate human and structural assets in the acute care environment to improve patient outcomes and professional nursing practice.

Aside from the time-honored clinical skin observation, professional development of nurses related to pressure ulcer detection and documentation can achieve optimal outcomes by using available reliable and valid detection tools and established evidence based standards. These measures will assist in the adoption of regulatory requirements to guide to care for patients and to assure the viability of organizations. Quality management departments will continually monitor nurse-sensitive indicators to evaluate and improve nursing practice and patient outcomes. Furthermore, reportable data and benchmark ratings will continue to be transparent externally to the public, influencing consumer choice in healthcare decisions. Nursings' commitment to improving risk factor identification, preventive strategies, and accurate

documentation must be driven by the needs of patients and families and care planning followed through the course of hospitalization. Nursing care in the Emergency Department includes life-saving and technical procedures, but also encompasses detection, prevention, and documentation of serious potential consequences of illness, including pressure ulcers.

Several limitations of this project are acknowledged. The relatively small convenience sample of nurses makes it difficult to generalize findings across settings with different patient populations. Future work should use numerous emergency departments at multiple sites to improve generalizability of the results. The investigator needed to conduct the program within a restricted time period as nurses needed to cover unit duties to relieve colleagues in order to attend the educational in-service. Confounding variables include time management and attendance issues when attempting to reach as many RN's in the ED as possible. Clearly, when management values education and professional growth, time is offered with paid participation to attend in-service offerings. Likewise, the environment in the ED itself is so unpredictable, reaching nurses and having their full attention is a challenge, as a case can come through the door at any time.

A follow–up project could potentially assist this investigator in determining whether the knowledge gained from this program yielded favorable outcomes. The importance of retention of the gain in knowledge beyond the immediate PU project offering is an important outcome that must be considered. As chart audits, access to quarterly HAPU rates, and wound/ostomy referrals were not part of this project, it is unknown the degree to which knowledge gained transferred into nursing practice. Allowing for and addressing attrition is an important limitation in any work involving human behavior, change theory, and retention strategies.

Using 19 questions from the Pieper and Mott 47-question measure altered the reliability and validity of the established questionnaire. The original Pieper document was tested on nurses in the ICU setting. Although this author adapted the tool, considering content and time, the length of the questionnaire was considered an important factor in terms of respondent burden. Moreover, the absence of a scientifically tested risk prediction tool like the Braden scale in the ED makes it difficult for nurses to fully appreciate this aspect of patient care assessment when it is not part of expected practice. It is difficult to expect ED nurses to practice preventive care planning if pressure ulcer risk and skin care are not required assessment fields in the computer documentation system. This project undoubtedly will add to the growing body of risk assessment, surveillance, staging, and documentation knowledge in acute care settings. Several of the participants mentioned that recent changes in the Med Host computer system were confusing, as accurate descriptors were not available for documentation. In addition, qualitative interviews may have allowed nurses to highlight concerns and strategies about implementation practices in their clinical area in a way that is not possible with a pre-post design. The lack of physician involvement in this project highlights the continued effort needed to pursue collaborative relationships in future research endeavors. Finally, since this investigator did not have access to administrative information about funding priorities in this institution, there was no way of predicting if the value of pressure ulcer care would remain a quality care priority.

Recommendations and Implications for Advanced Practice Nursing

The Clinical Nurse Specialist advocates for updated evidence based practice guidelines for detection, prevention, and management of pressure ulcers that are adapted to the practice environment and rigorously tested for implementation across the acute healthcare system. Although pressure ulcer care may not be viewed as glamorous in the context of ED nursing practice, recognizing that there are certain features that increase a patient's risk allows nurses to implement early preventive treatment and surveillance care plans. These skills are particularly valuable in the deconditioning phase of illness, when the nurse is instrumental in preventing the skin from opening up as pressure advances from a stage I wound to a stage II sore. Critically ill patients are among those with the most significant deficits in activity, nutrition, sensory perception, mobility friction and shear. Pressure ulcers have a negative impact on patients recovery and well being. Partnerships are needed between patients, families, and healthcare providers, as they are the primary recipients of care and often have insightful strategies to accomplish healthcare goals. Equally, a supportive professional practice environment necessitates leadership and commitment to excellence from management and RNs in all care settings. Nurse leaders should identify and target research efforts at reducing barriers within the organization such as staffing ratios, mechanisms of communication, resources for treatment supplies, and computer based obstacles. To ensure that best practice guidelines link behaviors in the professional practice model to improved patient outcomes, nurse leaders must be prepared to take risks when investigating and implementing innovative healthcare strategies. The combined impact of aging, illness, and economic decline means that acute care institutions need to integrate risk assessment tools and clinical judgment into a prediction model to prevent the adverse outcomes of pressure ulcer development. Clarification of roles and responsibilities of physicians,

staff, unit managers, and administrative leaders are important and seeks to provide opportunities and supports when planning and communicating preventive, evidence based pressure ulcer practice. Health care professionals must understand that sharing resources, creating and implementing educational plans, standardizing product stock, and communicating and documenting the patient care plan will improve client outcomes. Advanced practice nurses lead the way in formulating research agendas and disseminating the results to healthcare professionals to improve practice environments. Educational programs, audits, and benchmarking, along with the use of opinion leaders, are effective pressure ulcer dissemination strategies. The nurse leader can weave theories of adult learning into educational programs, like the work done by Bandura and Rogers to encourage the process of knowledge transfer into practice, and build on personal motivation to achieve sustained behavioral changes. Likewise, social influence strategies, which concentrate on peer acceptance, group cohesion, habits, and social norms as defining motivators for behavioral change, are needed. When the advanced practitioner takes an active role in local and national professional organizations, civic duties, and community outreach, he/she role models skills and provide opportunities for enhancing as well as expanding health-care services locally, regionally, and nationally. Actively sharing advanced knowledge with newer nurses as well as participating in social or educational enrichment activities assists the advanced practice nurse in integrating dimensions of their professional life with an appreciation of other professionals' skills. The increasing complexity of health services, advances in technology, changing health care needs, and structural changes in the delivery of health-care services highlight the need for advanced practice nurses to investigate innovative strategies that are culturally sensitive and economically sound.

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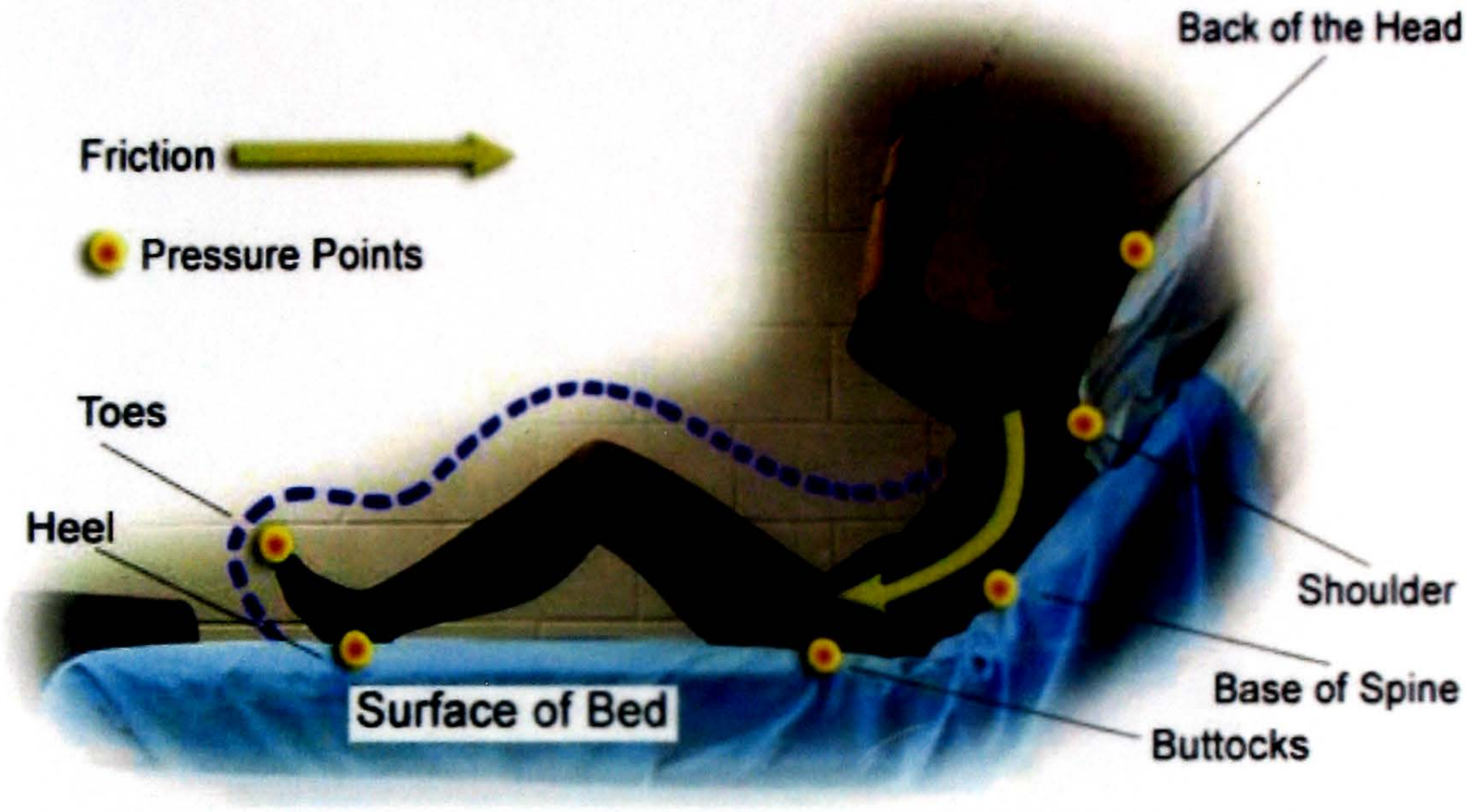
Appendix A

Program Flyer

Pressure Ulcer Research: In-servicing for the Emergency Room Staff



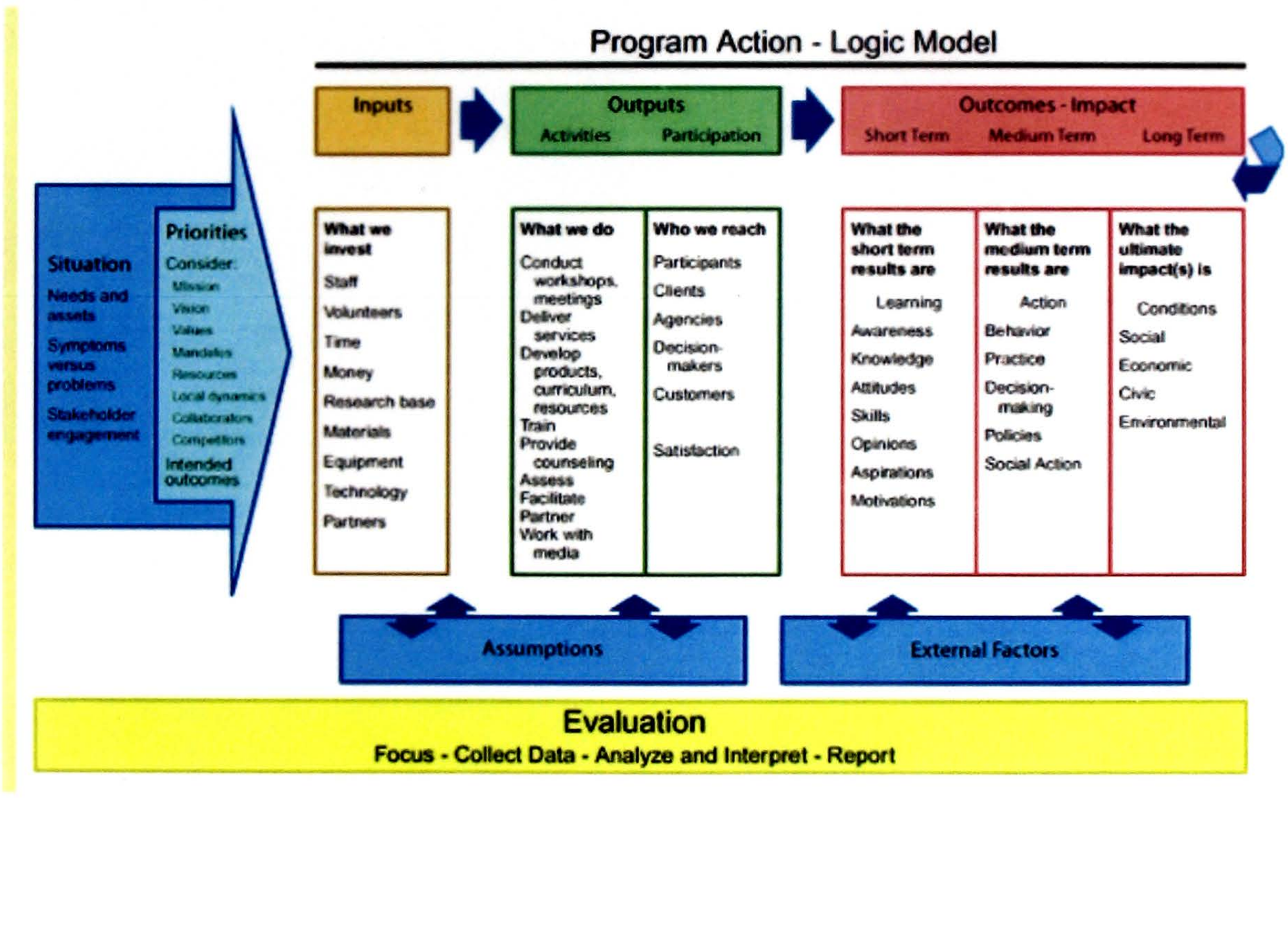
Topics:
NDNQI Pressure Ulcer Staging Definitions
Present on Admission CME Regulations
Identifying Risk Factors
Documentation Guidelines

By Margaret D'Orazio,
Graduate Nursing Student at RIC
Dates to be Announced
Location: ED Educator's Office

Attendance is voluntary
Please call Margaret with questions at 578-7371

Appendix B

Logic Model


Program Action - Logic Model
Inputs
Outputs
Activities
Participation
Outcomes - Impact
Short Term
Medium Term
Long Term
Situation
Needs and assets
Symptoms versus problems
Stakeholder engagement
Priorities
Consider:
Mission
Vision
Values
Mandates
Resources
Local dynamics
Collaborators
Competitors
Intended outcomes
What we invest
Staff
Volunteers
Time
Money
Research base
Materials
Equipment
Technology
Partners
What we do
Conduct workshops, meetings
Deliver services
Develop products, curriculum, resources
Train
Provide counseling
Assess
Facilitate
Partner
Work with media
Who we reach
Participants
Clients
Agencies
Decision-makers
Customers
Satisfaction
What the short term results are
Learning
Awareness
Knowledge
Attitudes
Skills
Opinions
Aspirations
Motivations
What the medium term results are
Action
Behavior
Practice
Decision-making
Policies
Social Action
What the ultimate impact(s) is
Conditions
Social
Economic
Civic
Environmental
Assumptions
External Factors
Evaluation
Focus - Collect Data - Analyze and Interpret - Report

Appendix C

Informational Letter

The Miriam Hospital
A Lifespan Partner

164 Summit Avenue
Providence, RI 02906
Tel 401 793-2500

You are being invited to participate in a research project being conducted by a RIC master's student. The purpose is to educate emergency room registered nurses on pressure ulcer risk factors, staging and accurate documentation. If you agree to participate here is what will happen. You will be asked to complete a survey about pressure ulcer assessment and management. Completing it will take about 5 minutes of your time. Then, if you agree, you will be invited to attend an educational program held in the ED as a Lunch and Learn. The program will take about 20 minutes. If you participate in the program, you will then be sent another survey to complete about your knowledge of PU assessment and management. There are no questions that should cause you any discomfort. Your taking part in this project is completely voluntary. If you do not want to complete the test you are free to choose not to fill out the survey. Your supervisor will not be informed about your choice to participate or not, or your test results, should you choose to participate.

Your completion of the test may not benefit you personally. We are hoping these completed test will provide information to help us provide better care to all our patients in this hospital. Your test results will be kept confidential. If you have any questions about this survey or the project itself, please feel free to ask the investigator providing you with this information. If you have any questions about your rights as a participant in this project please feel free to call the principle investigator Cynthia Padula, PhD, RN, CS, Director of the Master's Program in Nursing at Rhode Island College at 401-456-9720.

Thank you very much for your time and for considering participating in this project.

Sincerely,

Margaret A. D'Orazio BS, RN
Master's Student in Nursing, Rhode Island College (401-578-7371).

Rhode Island Hospital
IRB Approved
1/8/10
Expiration Date
12/14/10

Appendix D

NPUAP Staging Card

smith&nephew

Pressure ulcer staging system*

Deep tissue injury

Definition
Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear.

Description
- The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.
- Deep tissue injury may be difficult to detect in individuals with dark skin tones.
- Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar.
- Evolution may be rapid exposing additional layers of tissue even with optimal treatment.

Stage I

Definition
Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.

Description
- The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue.
- Stage I may be difficult to detect in individuals with dark skin tones.
- May indicate "at risk" persons (a heralding sign of risk)

Stage II

Definition
Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.

Description
- Presents as a shiny or dry shallow ulcer without slough or bruising.**
- This stage should not be used to describe skin tears, tape burns, perineal dermatitis, maceration or excoriation.

WC-0244-0108

Stage III

Definition
Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.

Description
- The depth of a stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep stage III pressure ulcers.
- Bone/tendon is not visible or directly palpable.

Stage IV

Definition
Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.

Description
- The depth of a stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and these ulcers can be shallow.
- Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis possible.
- Exposed bone/tendon is visible or directly palpable.

Unstageable

Definition
Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed.

Description
- Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined.
- Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as "the body's natural (biological) cover" and should not be removed.

*Adapted from National Pressure Ulcer Advisory Panel's Pressure Ulcer Staging Classification. **Bruising indicates suspected deep tissue injury.

Appendix E

Modified Pieper & Mott Pressure Ulcer Knowledge Tool

Pressure Ulcer/Risk Assessment Knowledge Tool

Pre-Test

1. Risk factors for development of pressure ulcers are immobility, incontinence, impaired nutrition, and altered level of consciousness.

   True False

2. All individuals should be assessed on admission to a hospital for risk of pressure ulcer development.

   True False

3. In a side-lying position, a person should be at a 30 degree angle with the stretcher.

   True False

4. All individuals at risk for pressure ulcers should have a systematic skin inspection at least once a week.

   True False

5. To minimize the skin's exposure to moisture of incontinence, underpads should be used to absorb moisture.

   True False

6. A low Braden score is associated with increased pressure ulcer risk.

   True False

7. A low humidity environment may predispose a person to pressure ulcers.

   True False

8. A deep tissue injury is a purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear.

   True False

9. Blanching refers to whiteness when pressure is applied to a reddened area.

   True False

10. A pressure ulcer scar may break down faster than unwounded skin.

    True False

11. Slough is yellow or creamy necrotic tissue on a wound bed.

    True False

12. A patient with COPD who uses a BIPAP is at increased risk for pressure ulcers.

    True False

13. Stage IV pressure ulcers are a full-thickness skin loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining or tunneling.

    True False

14. Stage I pressure ulcers are defined as nonblanchable erythema.

    True False

15. Stage II pressure ulcers are a full-thickness skin loss.

    True False

16. A Stage III pressure ulcer is a partial-thickness skin loss involving the epidermis and/or dermis.

    True False

17. Some ulcers develop before they are visible as open wounds

    True False

18. Stage I pressure ulcers are difficult to identify in persons with darkly pigmented skin

    True False

19. A skin tear is properly documented as a stage II in the medical record

    True False

Appendix F

Intrinsic / Extrinsic Factors

Extrinsic Factors

Excessive Uniaxial Pressure

Friction and Shear Forces

Impact Injury

Heat

Moisture

Posture

Intrinsic Factors

Immobility

Sensory Loss

Age

Disease

Body Type

Poor Nutrition

Infection

Incontinence

Pressure Ulcer

Appendix G

Pressure Ulcer Program Evaluation Tool

Program Evaluation Tool

Please rate the following aspects of the program and supply helpful comments

1- Poor 2- Fair 3- Effective 4- Very Effective 5- Excellent

1. **Welcome and Introduction:**_____
2. **Objectives met:**_____
3. **Speaker clear and effective:**_____
4. **Program content:**_____
5. **Organization:**_____
6. **Relevancy to ED:**_____

Comments:

_____

_____

_____

What aspects of the program do you think needs improvement?

_____

_____

Do you think the program is useful as an educational tool?